Acquisition of the *Wh*-interrogative Construction by Japanese Junior High School EFL Learners

Megumi Hasebe and Hideki Maki
Yokohama National University and Gifu University

1. Introduction

In this paper, we investigate the acquisition of *yes*/*no* and *wh* interrogative constructions in English by Japanese junior high school EFL learners. Since the 1970's, syntactic researchers have focused on subject/non-subject asymmetries with *wh*-movement (Koopman, 1983; among others), which some (Lasnik & Saito, 1984; among many others) have attempted to explain in terms of the Empty Category Principle (ECP) proposed by Chomsky (1981), considered to constitute one of the principles of universal grammar. Since the late 1980's, in the field of Second Language Acquisition (SLA), some researchers have investigated the relationship between universal grammar and second language acquisition (White, 1989, 2003; among others), and EFL learners' developmental sequences of the *wh*-interrogatives (Pienemann, Johnston, & Brindley, 1988; among others). Furthermore, some SLA researchers report that Korean/Japanese university EFL learners showed an argument/adjunct asymmetry and a subject/object asymmetry in the level of acquisition with respect to the *wh*-interrogative construction (Lee, 2008; Hasebe, Maki, & Umezawa, 2012; among others). However, the results of the previous studies are not consistent.

Our research question is then what results of the previous studies will be actually supported by examining the acquisition of the *wh*-interrogative construction by Japanese junior high school EFL learners. To address this question, we created the *Wh*-interrogative Formation Test in English, and administered it to 259 Japanese junior high school EFL learners.

The organization of this paper is as follows. Section 2 provides a review of the literature relevant for the subsequent sections, and Section 3 presents the materials used in this study. Section 4 reports the results of the analysis, and Section 5 discusses what the findings might suggest. Finally, Section 6 concludes this paper.

2. Background

2.1. Literature

According to the theory of universal grammar, a set of universal principles characterizes the grammars of all possible natural languages. That the principles of universal grammar are available to children when acquiring a first language is fairly uncontroversial. Some studies argue that universal grammar is also available in SLA (White, 1989, 2003; among others). These studies propose that first and second language acquisition are similar, and that second language learners utilize language input in order to construct a grammar to understand and produce the learning language. In this paper, focusing on the *wh*-interrogative construction, we investigate the process in which Japanese junior high school EFL learners acquire the construction. There are two previous studies with respect to the acquisition of the *wh*-interrogative construction. Lee (2008) administered a grammaticality judgment task with respect

* An earlier version of this paper was presented at the Second Language Research Forum 2012 held at Carnegie Mellon University on October 21, 2012. We would like to thank the audience at the meeting, as well as Jessica Dunton, Roger Martin, Michael Sevier, and Kengo Suzuki for their valuable comments on an earlier version of this paper. We are also grateful to Masanori Igarashi of Tokyo Shoseki, who kindly allowed us to use part of *New Horizon English Courses 1, 2, and 3* for developing the New Horizon version of the jMET. We would also like to express our gratitude to Tsuguo Tomioka and Masaya Yamazaki of Sanseido, who kindly allowed us to use part of *New Crown English Series 1, 2, and 3* for developing the New Crown version of the jMET. All errors are our own. This research was supported in part by the grant from the Collaborative Center for Academy/Industry/Government, Gifu University for the Research Group on English Education.

to the *wh*-interrogative construction to Korean EFL learners, and found that they show an argument/adjunct asymmetry in acquisition of inversion in *wh*-interrogatives. Furthermore, Hasebe, Maki, and Umezawa (2012) investigated the acquisition of the *wh*-interrogative construction using a translation test, and found that Japanese ESL learners showed an argument/adjunct asymmetry and a subject/object asymmetry. Section 2.1.1 and 2.1.2 provide the summary of these studies, respectively.

2.1.1. Lee (2008)

Lee (2008) conducted a grammaticality judgment task with 41 Korean EFL learners in order to investigate the argument/adjunct asymmetry in the acquisition of inversion in *wh*-questions. The grammaticality judgment task was prepared as a listening test, and the participants were asked to indicate whether each sentence sounded grammatical in English on a Likert scale, which rates a sentence's grammaticality on a scale from -2 (sounds completely wrong) to +2 (sounds perfectly correct). In the test sentences, *what* and *who* were chosen for argument questions, and *how* and *why* for adjunct question. For each type of *wh*-question, inverted (grammatical) and uninverted (ungrammatical) sentences were used in Lee's research. (1)-(2) show some examples of the test sentences, and Table 1 provides the result of the judgment task.

(1) *Example of Test Sentences (Inverted/Grammatical)*
   a. Who are you meeting in the cafeteria?
   b. What are you reading in the library?
   c. Why are you jumping on the bed?
   d. How are you going to the campground?

(2) *Example of Test Sentences (Uninverted/Ungrammatical)*
   a. Who you are meeting in the cafeteria?
   b. What you are reading in the library?
   c. Why you are jumping on the bed?
   d. How you are going to the campground?

Table 1
Average scores in Lee's (2008) study

	a. *who*	b. *what*	c. *why*	d. *how*
(1) inverted	0.74	1.27	0.81	1.20
(2) uninverted	-0.09	0.00	-0.48	-0.54

The analysis shows that a statistically significant difference was not found between argument questions and adjunct questions in the inverted *wh*-question judgment task. However, there was a statistically significant difference between them with respect to the uninverted *wh*-question judgment task. For Korean EFL learners, it was more difficult to notice the ungrammaticality of the uninverted adjunct *wh*-question than that of the uninverted argument *wh*-question. This result indicates that Korean EFL learners showed an argument/adjunct asymmetry in the acquisition of *wh*-interrogatives, and that subject-aux inversion in argument *wh*-interrogatives was easier than that in adjunct *wh*-interrogatives for them.

2.1.2. Hasebe, Maki, and Umezawa (2012)

Hasebe *et al*. (2012) investigated whether Japanese EFL learners would show an argument/adjunct asymmetry and a subject/object asymmetry with respect to the *wh*-interrogative construction based on the translation test which they created. They administered the translation test to 191 college and university students. The participants translated 30 Japanese sentences into English. In the translation test, there were three types of *wh*-questions: subject *wh*-extraction, object *wh*-extraction, and adjunct *wh*-extraction; *who* was chosen for argument (subject and object) *wh*-questions and *why* for adjunct *wh*-questions. (3) shows some examples of the test sentences, and Table 2 provides the result of the translation test.

(3) *Examples of Test Sentences*[1]
   a. Dare-ga Pam-o mituke-masi-ta ka.
      who-NOM Pam-ACC find-polite-past Q
      'Who found Pam?'
   b. Ron-wa dare-wo mituke-masi-ta ka.
      Ron-TOP who-ACC find-polite-past Q
      'Who did Ron find?'
   c. Naze Ron-wa Pam-o mituke-masi-ta ka
      why Ron-TOP Pam-ACC find-polite-past Q
      'Why did Ron find Pam?'

Table 2
Average scores (%) in Hasebe et al.'s (2012) study

	a. subject *who*	b. object *who*	c. argument *why*
Beginner (*n*=51)	30.39	17.16	38.24
Intermediate (*n*=76)	27.30	47.04	63.16
Advanced (*n*=64)	37.89	39.84	59.77

In this study, 191 participants were classified into three level EFL groups based on the scores on a reliable English proficiency test. First, for the intermediate and the advanced level learners, there was a statistically significant difference between subject *wh*-extraction and adjunct *wh*-extraction. For the beginner level learners, however, a statistically significant difference was not found. Furthermore, there was a statistically significant difference between object *wh*-extraction and adjunct *wh*-extraction for each EFL level learner. Therefore, the intermediate and advanced EFL learners showed an argument/adjunct asymmetry in acquisition of *wh*-interrogatives, and for them, it was more difficult to acquire argument *wh*-extraction than adjunct *wh*-extraction. Second, the Japanese EFL learners showed two different tendencies in terms of the subject/object asymmetry in *wh*-extraction. For the beginner level EFL learners, subject *wh*-extraction was easier than object *wh*-extraction. On the other hand, the intermediate learners showed the opposite tendency. For them, object *wh*-extraction was easier than subject *wh*-extraction.

2.2. Research Questions

Given these previous studies, we investigate the acquisition of the *yes*/*no*-interrogative construction and four types of *wh*-interrogative constructions (subject, object, pseudo adjunct, adjunct) by Japanese junior high school EFL learners. Since Japanese EFL learners typically learn these interrogative constructions for the first time in junior high school, we focused on this school level. In this paper, we focus on three main research questions, as shown in (4).

(4) *Research Questions*
   a. Between the *yes*/*no*-interrogative construction and the *wh*-interrogative construction, is there any difference in the level of acquisition?
   b. Between argument *wh*-extraction and adjunct *wh*-extraction, is there any difference in the level of acquisition?
   c. Between subject *wh*-extraction and object *wh*-extraction, is there any difference in the level of acquisition?

If the answer to research question (4b) is *yes*, and argument *wh*-extraction is easier than adjunct *wh*-extraction, it supports the results of Lee (2008). On the other hand, if it is *yes*, and adjunct *wh*-extraction is easier than argument *wh*-extraction, it supports the results of Hasebe *et al*. (2012). Furthermore, if the answer to research question (4c) is *yes*, and if there is a significant difference

[1] The following abbreviations are used for Japanese data: ACC = accusative case, NOM = nominative case, past = past tense, polite = polite form, Q = question marker, and TOP = topic marker

between subject *wh*-extraction and object *wh*-extraction, it also supports the results of Hasebe *et al*. (2012). To address these research questions, we created the *Wh*-interrogative Formation Test in English, which is discussed and illustrated in Section 3.1.

3. Materials

3.1. The Wh-interrogative Formation Test

In order to investigate the acquisition of the interrogative construction by Japanese junior high school EFL learners, we created the *Wh*-interrogative Formation Test in English. The test sentences contain the *yes*/*no*-interrogative construction and four types of the *wh*-interrogative construction, some of which are shown in (5). All the target sentences are provided in Appendix 1.

(5) a. *Yes/No question: Do-support*
Question: Ron found Pam.
(make an interrogative sentence whose answer is 'Yes, she did'.)
Answer: Did Ron find Pam?
b. *Subject wh-extraction: Who*
Question: <u>Ron</u> found Pam.
(make an interrogative sentence which asks the underlined part.)
Answer: **Who** found Pam?
c. *Object wh-extraction: Who/What*
Question: Ron found <u>Pam</u>.
(make an interrogative sentence which asks the underlined part.)
Answer: **Who** did Ron find?
d. *Pseudo adjunct wh-extraction: When*
Question: Ron found Pam <u>two days ago</u>.
(make an interrogative sentence which asks the underlined part.)
Answer: **When** did Ron find Pam?
e. *Adjunct wh-extraction: Why*
Question: Ron found Pam <u>because she rode the bus</u>.
(make an interrogative sentence which asks the underlined part.)
Answer: **Why** did Ron find Pam?

We created two types of test sheets for the counterbalanced design. The test sentences have five types of structures shown in (5), which constitute minimal pairs. We used six verbs which take a human subject and a human object (*see, find, help, catch, hit, save*), and six verbs which take a human subject and an inanimate object (*read, eat, write, buy, wash, play*) in the test sentences[2]. All the verbs used are amongst those taught at junior high school in Japan. Therefore, there are 12 examples in each type of structure, and each test sheet contains six examples (three verbs that take a human object, and three verbs that take an inanimate object) based on the Latin square method. Both types of test sheets consisted of 30 questions in total.

3.2. The junior Minimal English Test (jMET)

In order to measure the participants' EFL proficiency, we used the junior Minimal English Test (jMET)[3] developed by Maki *et al*. (2011)[4]. The jMET is based on passages adopted from three

[2] Lee (2008) shows a statistically significant difference between *what* and *who* in subject-aux inversion of argument *wh*-questions in terms of the grammaticality judgment task. We therefore used the equal number of verbs that take a human object and those that take an inanimate object.

[3] The jMET was based on the Minimal English Test 6 (MET 6) developed by Maki *et al*. (2010). After the development of the MET 6 in 2009, they investigated the correlations between the scores on the MET 6 and the scores on the University Entrance Examination in Japan from 2009 to 2012 ($.53 < r < .60$, $p < .05$).

[4] They investigated whether there would be a statistically significant correlation (i) between the scores on the jMET and the scores on the midterm test, which is based on the textbooks *New Horizon English Courses 1, 2, and 3*, and (ii) between the scores on the jMET and the scores on the achievement test, which is made independently of the textbooks. Through a regression analysis, they found statistically significant strong correlations between the

textbooks widely used in junior high schools in Japan: *New Horizon English Courses 1, 2, and 3* by Kasashima *et al*. (2006a, 2006b, 2006c). The jMET was designed along the rules in (6). The test sheet of the jMET is provided in Appendix 2.

(6) a. Every 6th word is left blank in the jMET.
b. Japanese words, years, and unpronounced words in parentheses are ignored.

The jMET contains nine independent dialogues, which are written in 37 lines. There are 67 blank spaces in the jMET, and it takes about five minutes to complete it. Participants are required to write an English word in each blank space of the given sentences while listening to a CD, which is based on the CDs that accompany the textbooks. The CD reads out the sentences at a speed of 120 words per minute.

3.3. Participants

We conducted a survey during the period of November-December 2011. A total of 259 Japanese junior high school students, who were learning English as a foreign language in Japan (142 females and 117 males, age range 12 years 11 months to 14 years 11 months, and average age 13.64 years 5.65 months). Based on the Deviation Scores (*DS*) on the jMET, the participants were classified into three level groups (81 beginner level ESL learners, 93 intermediate level ESL learners, and 85 advanced level ESL learners). The participants of the beginner level learners had $DS < 45$, those of the intermediate level learners had $45 \leq DS < 55$, and those of the advanced level learners had $55 \leq DS$[5].

4. Results

This section reports the results of the *Wh*-interrogative Formation Test. We address research questions (4a), (4b), and (4c) in Section 4.1, Section 4.2, and Section 4.3, respectively. Section 4.1 compares *yes/no* interrogatives and four types of *wh*-interrogatives. Section 4.2 presents our results concerning argument/adjunct asymmetries in *wh*-interrogatives, whereas the results concerning subject/object asymmetries are discussed in Section 4.3. In Section 4.4, we consider the steps in the acquisition of each type of interrogative construction. We conducted a repeated measure of ANOVA and a multiple comparison (Bonferroni) with the collected data. In all statistical analyses, the significant level was set at $\alpha < .05$.

4.1. Comparison Between Yes/No Question and Wh-extraction

This subsection addresses research question (4a). We analyzed the data by a repeated measure of 3 × 5 (three EFL levels, and five types of the interrogative construction) ANOVA and Bonferroni. Table 3 shows the descriptive statistics of the *Wh*-interrogative Formation Test.

---

scores on the jMET and (i) the scores on the midterm test ($r = .76$, $n = 299$, $p < .05$) and (ii) the scores on the achievement test ($r = .75$, $n = 299$, $p < .05$). Therefore, the jMET can function as a prediction test for more comprehensive English tests for Japanese junior high school EFL learners.

[5] We also administered another version of the jMET based on the textbooks *New Crown English Series 1-3*, which are also very often used in junior high school in Japan. The New Crown version of the jMET was developed by Maki *et al*. (2013), who found strong correlations between the scores on the jMET and (i) the total scores on the term tests and (ii) the total scores on the achievement tests for the 8th and 9th graders. Maki *et al*. (2013) also found a statistically significant strong correlation between the scores on the New Horizon version of the jMET and the scores on the New Crown version of the jMET ($r = .86$, $n = 299$, $p < .05$). In this paper, we used the New Horizon version of the jMET on classification of the participants, but the same classification was obtained on the basis of the scores on the New Crown version of the jMET.

Table 3
Descriptive statistics of the Wh-interrogative Formation Test

		Yes/No Type (5a)	Subject Type (5b)	Object Type (5c)	When Type (5d)	Why Type (5e)
All Participants	Average (%)	44.85	20.46	30.31	28.25	32.30
(N=259)	SD	38.79	34.31	39.11	41.33	40.84
Beginner	Average (%)	17.90	13.99	4.53	2.88	6.38
(N=81)	SD	27.36	29.75	14.19	14.38	18.18
Intermediate	Average (%)	48.03	14.16	28.32	23.84	29.93
(N=93)	SD	35.34	27.47	36.60	38.02	39.05
Advanced	Average (%)	67.06	33.53	57.06	57.25	59.61
(N=85)	SD	36.46	41.11	40.86	44.43	41.58

By ANOVA, we found a statistically significant (i) main effect for factor construction ($F(4, 253) = 36.86$, $p < .001$), and (ii) main effect for factor EFL level ($F(2, 256) = 62.71$, $p < .001$). We also found a statistically significant interaction between two factors ($F(4, 254) = 7.40$, $p < .001$).

By multiple comparisons, as for all participants, there was a statistically significant difference between the average scores for the *yes*/*no* interrogative construction and the scores for each type of the *wh*-interrogative construction ($F(4, 253) = 36.86$, $p < .001$). The intermediate and the advanced level EFL learners also showed the same tendencies. As for the beginner level EFL learners, there were statistically significant differences between the average scores for the *yes*/*no* interrogative construction and the average scores for (i) object *wh*-extraction ($F(4, 253) = 6.23$, $p < .001$), (ii) pseudo adjunct extraction ($F(4, 253) = 6.23$, $p < .001$), and (iii) adjunct extraction ($F(4, 253) = 6.23$, $p < .001$). However, a statistically significant difference was not found between the average scores for the *yes*/*no* interrogative construction and those for subject *wh*-extraction ($F(4, 253) = 6.23$, $p = 1.00$).

4.2. Argument/Adjunct Asymmetry

This subsection addresses research question (4b). We analyzed the data by a repeated measure of 3 × 2 (three EFL levels, and two types of the interrogative construction) ANOVA and Bonferroni. Table 4 shows the descriptive statistics.

Table 4
Descriptive statistics of argument and adjunct wh-extraction

		Argument Type (5b+5c)	Adjunct Type (5d+5e)
All Participants	Average (%)	25.39	30.28
(N=259)	SD	28.76	39.49
Beginner	Average (%)	9.26	4.63
(N=81)	SD	18.35	13.63
Intermediate	Average (%)	21.24	26.88
(N=93)	SD	24.22	36.82
Advanced	Average (%)	45.29	58.43
(N=85)	SD	30.11	40.98

By ANOVA, we found a statistically significant (i) main effect for factor construction ($F(1, 256) = 8.94$, $p = .003$), and (ii) main effect for factor EFL level ($F(2, 256) = 61.64$, $p < .001$). We also found a statistically significant interaction between two factors ($F(2, 256) = 10.29$, $p < .001$).

By multiple comparisons, as for all participants, there was a statistically significant difference between the average scores for argument *wh*-extraction and those for adjunct *wh*-extraction ($F(1, 256) = 8.94$, $p < .003$). For the Japanese EFL learners, the *wh*-interrogative with adjunct extraction was easier

than the *wh*-interrogative with argument extraction. The intermediate EFL learners ($F(1, 256) = 4.58$, $p < .033$) and the advanced EFL learners ($F(1, 256) = 22.95$, $p < .001$) also showed an argument/adjunct asymmetry in the level of acquisition of the *wh*-interrogative construction. However, as for the beginner EFL level learners, a statistically significant difference was not found between the average scores for argument *wh*-extraction and those for adjunct *wh*-extraction ($F(1, 256) = 2.71$, $p = .101$).

4.3. Subject/Object Asymmetry

In the previous subsection, we found that the Japanese junior high school EFL learners showed an argument/adjunct asymmetry with respect to the *wh*-interrogative construction. In this subsection, we focus on the *wh*-interrogative construction with argument extraction, and address research question (4c). We analyzed the data by a repeated measure of 3 × 2 × 2 (three EFL levels, two type (argument/adjunct), and two trace (subject/object)) ANOVA and Bonferroni. Table 5 shows the descriptive statistics.

Table 5
Descriptive statistics of subject and object wh-extraction

		Subject Type (2b)	Object Type (2c)
All Participants (N=259)	Average (%)	20.46	30.31
	SD	34.31	39.11
Beginner (N=81)	Average (%)	13.99	4.53
	SD	29.75	14.19
Intermediate (N=93)	Average (%)	14.16	28.32
	SD	27.47	36.60
Advanced (N=85)	Average (%)	33.53	57.06
	SD	41.11	40.86

By ANOVA, we found a statistically significant (i) main effect for factor type ($F(1, 256) = 8.94$, $p = .003$), (ii) main effect for factor trace ($F(1, 256) = 18.19$, $p < .001$), and (iii) main effect for factor EFL level type ($F(2, 256) = 61.64$, $p < .001$). We also found a statistically significant interaction among three factors ($F(2, 256) = 10.31$, $p < .001$).

By multiple comparisons, as for all participants, there was a statistically significant difference between the average scores on subject *wh*-extraction and those on object *wh*-extraction ($F(1, 256) = 11.72$, $p < .001$). For the Japanese EFL learners, object *wh*-extraction was easier than subject *wh*-extraction. The intermediate EFL learners ($F(1, 256) = 4.18$, $p < .042$) and the advanced EFL learners ($F(1, 256) = 22.99$, $p < .001$) showed a subject/object asymmetry with respect to the *wh*-interrogative construction. The beginner EFL level learners also showed a statistically significant difference between the average scores on subject *wh*-extraction and those on object *wh*-extraction ($F(1, 256) = 4.82$, $p < .029$). However, the beginner level EFL learners showed a different tendency from the intermediate and the advanced level EFL learners. For the beginner level learners, subject *wh*-extraction was easier than object *wh*-extraction[6].

[6] In this research, we used two types of object *wh*-extraction. One type contains verbs that take a human object, and the other contains verbs that take an inanimate object. We found that the Japanese EFL learners showed an animate/inanimate asymmetry in the *wh*-interrogative construction with object extraction ($F(1, 256) = 26.23$, $p < .001$), as shown in Table I. The result of the animate/inanimate asymmetry supports the result of Lee (2008).

Table I
Descriptive statistics of animate and inanimate object wh-extraction

		Animate Object	Inanimate Object
All Participants (N=259)	Average (%)	26.38	34.23
	SD	39.09	42.87

4.4. Acquisition Steps

In the above subsections, we discussed results that indicate some asymmetries in the level of acquisition with respect to interrogative constructions. We found that beginner level learners showed a different tendency from intermediate and the advanced level learners. This fact seems to suggest steps of acquisition of interrogative constructions by the Japanese junior high school EFL learners. To be specific, as for the structures in (5b) and (5c), for beginner level learners, it seems to be more difficult to acquire object extraction than subject extraction, while the situation is opposite for intermediate and advanced level learners. In order to fully investigate the acquisition steps with respect to interrogative constructions, we divided the data into eight groups (Level-1 to Level-8, where Level-1 < … < Level-8) based on the scores on the *Wh*-interrogative Formation Test (types (5a), (5b), (5c), and (5d+e)), as shown in Table 6.

Table 6
Average scores (%) on the 8 level EFL groups

Level	Score Range	Observations	Yes/No Type (5a)	Subject Type (5b)	Object Type (5c)	Adjunct Type (5d+e)
1	0-3	111	9.76	2.70	0.90	0.53
2	4-6	33	39.39	24.24	9.09	6.31
3	7-9	17	49.02	54.90	15.69	11.27
4	10-12	20	66.67	27.50	44.17	33.33
5	13-15	25	79.33	21.33	58.67	70.00
6	16-18	29	96.55	2.30	91.95	92.82
7	19-21	8	93.75	72.92	77.08	89.58
8	22-24	16	95.83	95.83	96.88	97.40

We conducted a repeated measure of 8 × 4 ANOVA (eight EFL levels, and four types of interrogative constructions), and found a statistically significant (i) main effect for factor construction ($F(3, 249) = 51.53$, $p < .001$), and (ii) main effect for factor EFL level ($F(7, 251) = 1686.21$, $p < .001$). We also found a statistically significant interaction between two factors ($F(7, 251) = 56.23$, $p < .001$).

By multiple comparisons, we found the steps for acquisition of each type of interrogative. First, as for the *yes/no* interrogative construction, we found statistically significant differences (i) between Level-1 and Level-2 ($F(7, 251) = 155.81$, $p < .001$), (ii) between Level-3 and Level-4 ($F(7, 251) = 155.81$, $p < .049$), and (iii) between Level-5 and Level-6 ($F(7, 251) = 155.81$, $p < .007$). Therefore, the higher the EFL level is, the higher the rate of correctness on the *yes/no* interrogative construction is. Second, there were statistically significant differences (i) between Level-1 and Level-2 ($F(7, 251) = 51.40$, $p < .001$), (ii) between Level-2 and Level-3 ($F(7, 251) = 51.40$, $p < .001$), (iii) between Level-3 and Level-4 ($F(7, 251) = 51.40$, $p < .007$), and (iv) between Level-6 and Level-7 ($F(7, 251) = 51.40$, $p < .001$) with respect to the subject *wh*-extraction. Therefore, the Japanese junior high school EFL learners seem to experience acquisition and regression of subject *wh*-extraction. Third and finally, we found statistically significant differences (i) between Level-3 and Level-4 ($F(7, 251) = 209.06$, $p < .001$), (ii) between Level-4 and Level-5 ($F(7, 251) = 209.06$, $p < .047$), and (iii) between Level-5 and Level-6 ($F(7, 251) = 209.06$, $p < .001$) with respect to object *wh*-extraction. As for adjunct *wh*-extraction, we also found statistically significant differences (i) between Level-3 and Level-4 ($F(7, 251) = 434.44$, $p < .001$), (ii) between Level-4 and Level-5 ($F(7, 251) = 434.44$, $p < .001$), and (iii) between Level-5 and Level-6 ($F(7, 251) = 434.44$, $p < .001$). Therefore, the Japanese junior high school EFL learners seem to acquire object *wh*-extraction and adjunct *wh*-extraction after the acquisition of the *do*-support operation (the *yes/no* interrogative construction).

5. Discussion

Let us now consider what the results of this study might suggest. First, let us compare the results between the present study and the previous studies. As for the argument/adjunct asymmetry, Lee (2008)

showed that it was more difficult for Korean EFL learners to acquire adjunct *wh*-interrogatives than argument *wh*-interrogatives. Hasebe *et al*. (2012), on the other hand, showed that it was more difficult for the intermediate and the advanced Japanese university EFL learners to acquire argument *wh*-interrogatives than adjunct *wh*-interrogatives. In this study, we found that it was more difficult for the intermediate and the advanced junior high school EFL learners to acquire argument *wh*-interrogatives than adjunct *wh*-interrogatives. Therefore, the result of the present study supports the results of Hasebe *et al*. (2012), rather than Lee (2008).

As for the subject/object asymmetry, the result of the present study also supports the results of Hasebe *et al*. (2012). Hasebe *et al*. (2012) show that Japanese university EFL learners showed two types of subject/object asymmetries. For the beginner learners, *wh*-interrogatives with subject extraction were easier than *wh*-interrogatives with object extraction. On the other hand, for the intermediate learners, *wh*-interrogatives with object extraction were easier than *wh*-interrogatives with subject extraction. The present research shows that Japanese junior high school EFL learners also showed two types of tendencies. For the beginner learners, subject *wh*-extraction was easier than object *wh*-extraction. On the other hand, for the intermediate and the advanced learners, object *wh*-extraction was easier than subject *wh*-extraction.

The question then arises as to what caused the asymmetries in acquisition among the types of the *wh*-interrogative construction. Let us consider these asymmetries in terms of their syntactic properties. First, let us consider the argument/adjunct asymmetry. As shown above, adjunct *wh*-extraction was easier than subject *wh*-extraction and object *wh*-extraction for Japanese ESL learners. Why is this so? We claim that adjunct *wh*-extraction involves less computational complexity than argument *wh*-extraction, following Rizzi's (1990) main idea. Based on the examples with the negative island effect in (7), Rizzi (1990) proposes that an adjunct *wh*-phrase can be directly base-generated in CP SPEC. Note that in (7b) *why* is intended to modify the predicate *come*, as in (7a).

(7) a. Why didn't you come?
b. *Why don't you think that John came?

Example (7b) illustrates the so-called negative island effect: the sentence is said to be ungrammatical since the adjunct *wh*-phrase that modifies the predicate in the embedded clause moves across the negation in the matrix clause on the way to the matrix CP SPEC. However, the grammaticality of (7a) is then not expected, if *why* must also move across negation to reach CP SPEC. Therefore, Rizzi (1990) proposes that the adjunct *wh*-phrase *why* can be base-generated in the CP SPEC of the clause it modifies. If this is the case, and if extraction of argument *wh*-phrases (subject and object) involves movement to CP SPEC rather than base-generation in CP SPEC, adjunct *wh*-extraction should not involve a movement operation, in contrast to argument *wh*-extraction, and the former is considered to involve less computational complexity. Therefore, we conclude that the argument/adjunct asymmetry is attributed to the difference in the base-generated position of the *wh*-phrase between adjunct *wh*-extraction and argument *wh*-extraction.

Second, let us turn to the subject/object asymmetry. We claim that this asymmetry is derived from the T-C movement asymmetry between object *wh*-extraction and subject *wh*-extraction suggested by Koopman (1983). For the intermediate ESL level learners, it was more difficult to conduct object *wh*-extraction than subject *wh*-extraction. The learners made frequent errors in inserting *did* between the *wh*-phrase and the verb. This phenomenon seems to indicate that after internalizing the *wh*-interrogative construction with object *wh*-extraction, they implicitly assume a non-string vacuous movement operation for the *wh*-interrogative construction as a whole, which leads to overgeneration of subject *wh*-extraction with *do*/*did* being inserted. Since the beginner level ESL learners are better at subject *wh*-extraction than object *wh*-extraction, the transition from the beginner level stage to the intermediate level stage clearly shows a process of internalization of the *wh*-movement strategy.

Finally, the results from the 8 × 4 ANOVA (eight EFL levels, and four types of interrogative constructions) and the multiple comparisons demonstrate that the Japanese junior high school EFL learners seem to experience six steps in the acquisition of interrogative constructions: (i) acquisition of the *do*-support operation (Level-2), (ii) acquisition of subject *wh*-extraction (Level-3), (iii) acquisition of object *wh*-extraction and regression of subject *wh*-extraction (Level-4), (iv) acquisition of adjunct *wh*-extraction (Level-5), (v) progress of object *wh*-extraction and adjunct *wh*-extraction (Level-6), and (vi) re-acquisition of subject *wh*-extraction (Level-7).

6. Conclusion

In this paper, we focused on the acquisition of the *wh*-interrogative construction in English by Japanese junior high school EFL learners. First, we addressed research question (4a), and compared the average scores between the *yes/no* interrogative construction and four types of the *wh*-interrogative construction. We found that all participants showed statistically significant differences between the *yes/no* interrogative construction and each type of the *wh*-interrogative construction ($F(4, 253) = 36.86$, $p < .001$). Thus, the answer to (4a) is *yes*. For them, it was more difficult to acquire the *wh*-interrogative construction than the *yes/no* interrogative construction.

Second, we addressed research question (4b), and compared the average scores between argument (subject and object) *wh*-extraction and adjunct *wh*-extraction. We found that all participants showed a statistically significant difference between the average scores on argument *wh*-extraction and those on adjunct *wh*-extraction ($F(1, 256) = 8.94$, $p < .003$). Thus, the answer to (4b) is also *yes*: Japanese junior high school EFL learners showed an argument/adjunct asymmetry in the acquisition of the *wh*-interrogative construction. For them, *wh*-interrogatives with adjunct extraction were easier than *wh*-interrogatives with argument extraction.

Third and finally, we addressed research question (4c), and compared the average scores between subject *wh*-extraction and object *wh*-extraction. We found that the Japanese junior high school EFL learners showed two types of tendencies in the acquisition of *wh*-interrogative constructions. For the intermediate EFL learners ($F(1, 256) = 4.18$, $p < .042$) and the advanced EFL learners ($F(1, 256) = 22.99$, $p < .001$), it was more difficult to acquire subject *wh*-extraction than object *wh*-extraction. For the beginner EFL learners, on the other hand, *wh*-interrogatives with object extraction were more difficult than ones with subject extraction ($F(1, 256) = 4.82$, $p < .029$). Thus, the answer to (4c) is again *yes*: Japanese EFL learners showed a subject/object asymmetry in the acquisition of *wh*-interrogative constructions.

Appendix 1: The *Wh*-interrogative Formation Test

(I) The *Yes*/*No* Interrogative Construction
(Please make an interrogative sentence whose answer is 'Yes, he/she did.')

a. John read the book.
b. Mary ate the apple.
c. David wrote the letter.
d. Kim bought the car.
e. Betty washed the cup.
f. Susan played the guitar.
g. Carol saw Bill.
h. Ron found Pam.
i. Richard helped Kate.
j. Becky caught Jack.
k. Linda hit Tom.
l. Jim saved Amy.

(II) The *Wh*-interrogative Construction with Subject Extraction
(Please make an interrogative sentence which asks the underlined part.)

a. <u>John</u> read the book.
b. <u>Mary</u> ate the apple.
c. <u>David</u> wrote the letter.
d. <u>Kim</u> bought the car.
e. <u>Betty</u> washed the cup.
f. <u>Susan</u> played the guitar.
g. <u>Carol</u> saw Bill.
h. <u>Ron</u> found Pam.
i. <u>Richard</u> helped Kate.
j. <u>Becky</u> caught Jack.

k. Linda hit Tom.
l. Jim saved Amy.

(III) The *Wh*-interrogative Construction with Object Extraction
(Please make an interrogative sentence which asks the underlined part.)
a. John read the book.
b. Mary ate the apple.
c. David wrote the letter.
d. Kim bought the car.
e. Betty washed the cup.
f. Susan played the guitar.
g. Carol saw Bill.
h. Ron found Pam.
i. Richard helped Kate.
j. Becky caught Jack.
k. Linda hit Tom.
l. Jim saved Amy.

(IV) The *Wh*-interrogative Construction with Pseudo Adjunct Extraction
(Please make an interrogative sentence which asks the underlined part.)
a. John read the book yesterday.
b. Mary ate the apple yesterday.
c. David wrote the letter last Sunday.
d. Kim bought the car last Sunday.
e. Betty washed the cup last night.
f. Susan played the guitar last night.
g. Carol saw Bill two days ago.
h. Ron found Pam two days ago.
i. Richard helped Kate last week.
j. Becky caught Jack last week.
k. Linda hit Tom this morning.
l. Jim saved Amy this morning.

(IV) The *Wh*-interrogative Construction with Adjunct Extraction
(Please make an interrogative sentence which asks the underlined part.)
a. John read the book because he learned French.
b. Mary ate the apple because she was hungry.
c. David wrote the letter because he visited Tokyo.
d. Kim bought the car because he liked it.
e. Betty washed the cup because she had coffee.
f. Susan played the guitar because she liked the music.
g. Carol saw Bill because he smiled at her.
h. Ron found Pam because she rode the bus.
i. Richard helped Kate because she was busy.
j. Becky caught Jack because he broke the chair.
k. Linda hit Tom because he was noisy.
l. Jim saved Amy because she had a problem.

Appendix 2: The junior Minimal English Test (jMET)

Student ID:_____ Name:_____ Date:_____ Score:____/67

Example: Please fill an English word into each blank space, while listening to the CD.

1. Ms. Green, this is my ( )[a] Mike. He's from Australia.
2. Mike, ( )[b] is Ms. Green. She's our ( )[c] English teacher.

Test: Please fill an English word into each blank space, while listening to the CD.

1. This is my family. This ( )[1] my sister Lisa.
2. She lives in ( )[2]. She likes Japan very much. ( )[3] husband Koji teaches Japanese.

3. Happy New ( )[4]! How are you doing? Are ( )[5] enjoying your first *oshogatsu*?
4. We're having ( )[6] great time in Canada. Yesterday ( )[7] walked across
5. the Rainbow Bridge to America. ( )[8] really enjoyed the view. See ( )[9] soon!

6. At night I went ( )[10] the shrine with Ms. Sato, the English ( )[11].
7. We saw a lot of ( )[12] there. I got home at ( )[13].
8. Then I called my family ( )[14] Canada. I went to bed ( )[15] two.

9. I read about the ( )[16] parking area plan. It is ( )[17] news.
10. I am against the ( )[18] because we need our parks.
11. ( )[19] know we have a problem ( ) [20] bikes.
12. But we can keep ( )[21] parks if we change our ( )[22].
13. Remember that the accident taught ( )[23] an important thing.
14. We can ( )[24] two things. One: Walk when ( )[25] don't have to ride
15. our ( )[26]. Two: Be careful when we ( )[27] our bikes.

16. Look at this! ( )[28] so big. It's about eight ( )[29] tall and weighs seventy tons.
17. ( )[30] call it a *moai*. Easter Island is very ( )[31].
18. But it has about one ( )[32] *moais*. These *moais* are standing on the ( )[33].
19. They're looking at the sky. ( )[34] are they thinking about?

20. Communication ( )[35] important. You have to speak ( )[36].
21. But you don't have to ( )[37] perfect English.
22. You're a member ( )[38] the family. You have to ( )[39] with the housework.

23. Hello, everyone. ( )[40] is your reporter, Maria Jones. Today I'm ( )[41] in a big park
24. in *Hirosaki*. ( )[42] going to go to a *shamisen* ( )[43].
25. I've lived in Japan for ( )[44] years, and I've loved
26. Japanese ( )[45] since I heard it for ( )[46] first time.

27. When you want ( )[47] order in Japanese restaurants, you ( )[48] say,
28. "*Sumimasen*," in a loud voice. ( )[49] in America, we just make ( )[50] contact
29. or raise our hand. ( )[51] I still have a hard ( )[52]
30. in Japanese restaurants. I always ( )[53], "*Sumi* … uh, uh, *sumimasen*," too quietly.
31. It's not easy ( )[54] me to get food. So ( )[55] get very hungry.

32. Thanks to ( )[56] help, our village has another ( )[57]. It is near my house.
33. ( )[58] I have already started going ( )[59] school again.
34. I have a ( )[60] of things to learn. My ( )[61] also go to
35. the same ( )[62]. There is a class for ( )[63].
36. They are learning to read ( )[64] write. We are very glad ( )[65] have a chance
37. to study ( )[66] at home. It is fun. ( )[67] you all very much.

References

Chomsky, Noam (1981). *Lectures on Government and Binding*. Forris, Dordrecht.

Hasebe, Megumi, Hideki Maki, & Toshiro Umezawa (2012). Two Types of Asymmetries in Acquisition of the Wh-Interrogative Construction by Japanese ESL Learners. *The Japan Association of Language and Culture* 38, 3-14.

Koopman, Hilda (1983). ECP effects in main clauses. *Linguistics Inquiry* 14, 346-350.

Maki, Hideki, Kengo Suzuki, Megumi Hasebe, Shogo Tokugawa, Ru-Wen Zhang, Ling-Yun Fan, Jessica Dunton, & Chise Kasai (2013). The junior Minimal English Test: A New Crown Version. *Proceedings of the Chubu English Language Education Society* 42, 147-152.

Maki, Hideki, Megumi Hasebe, Megumi Kato, Shogo Tokugawa, Chise Kasai, Toshiro Umezawa, Sachie Ono, & Jessica Dunton (2011). Progress in the junior Minimal English Test: A Study in Gifu Prefecture. *The 2011 Chubu English Language Education Society*. Fukui University, June 25, 2011.

Maki, Hideki, Sarenqimuge, Juri Yoshimura, Yuki Makino, Megumi Hasebe, Kenichi Goto, Takane Ito, Yoko Yumoto, Saotshi Oku, Michiyo Hamasaki, Yukiko Ueda, Kosuke Nagasue, Hironobu Kasai, Takashi Munakata, & Jessica Dunton (2010). The Minimal English Test: A Revised Version. *KOTESOL Proceedings 2009*, 225-232.

Lasnik, Howard, & Mamoru Saito (1984). On the nature of proper government. *Linguistics Inquiry* 15, 235-289.

Lee, Sun-Young (2008). Argument-adjunct asymmetry in the acquisition of inversion in wh-questions by Korean learners of English. *Language Learning* 58-3, 625-663.

Pienemann, Manfred, Malcolm Johnston, & Geoff Brindley (1988). Constructing an acquisition-based procedure for second language assessment. *Studies in second language acquisition* 10, 217-243.

Rizzi, Luigi (1990). *Relativized Minimality*. MIT Press, Cambridge, Mass.

White, Lydia. (1989). *Universal Grammar and Second Language Acquisition*. Amsterdam: John Benjamins.

White, Lydia. (2003). *Second Language Acquisition and Universal Grammar*. Cambridge: Cambridge University Press.

Selected Proceedings of the 2012 Second Language Research Forum: Building Bridges between Disciplines

edited by
Ryan T. Miller, Katherine I. Martin, Chelsea M. Eddington, Ashlie Henery, Nausica Marcos Miguel, Alison M. Tseng, Alba Tuninetti, and Daniel Walter

Cascadilla Proceedings Project Somerville, MA 2014

ISBN 978-1-57473-464-5 library binding

Ordering information

Orders for the library binding edition are handled by Cascadilla Press.
To place an order, go to www.lingref.com or contact:

Cascadilla Press, P.O. Box 440355, Somerville, MA 02144, USA
phone: 1-617-776-2370, fax: 1-617-776-2271, sales@cascadilla.com

Web access and citation information

This entire proceedings can also be viewed on the web at www.lingref.com. Each paper has a unique document # which can be added to citations to facilitate access. The document # should not replace the full citation.

This paper can be cited as:

Hasebe, Megumi and Hideki Maki. 2014. Acquisition of the *Wh*-interrogative Construction by Japanese Junior High School EFL Learners. In *Selected Proceedings of the 2012 Second Language Research Forum*, ed. Ryan T. Miller et al., 76-88. Somerville, MA: Cascadilla Proceedings Project. www.lingref.com, document #3087.